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Research Paper

Assessment And Determinant Of Causes And Risk Factors Associated With Maternal Morbidity And Mortality: A Comparative Study Between India And Nigeria.

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ABSTRACT
Despite the tremendous roles that women play in society-socially, economically and politically and most importantly that of their reproductive role which is a backbone in the breeding of human species. And it is a very joyful and celebration to both the couples, families as well as their community to see a successful pregnancy followed by healthy delivery and to reap the benefits of motherhood but, unfortunately, for some women in certain parts of the world more particularly in developing countries the reality of motherhood is often grim, austere and frightful they are no means risk-free in discharging of this remarkable role, of which, the majority of women die annually from complications of pregnancy and child birth. The heartsore and saddest part of the story is that almost 80 percent of these maternal morbidity and mortality are preventable, if there is good access to basic essential maternal health care services with special policy of free access to maternal health care services. An average of 1500 mothers die all over the world each day from complications related to pregnancy & childbirth and the vast majority of them belong to sub-Saharan African and south Asia (which both the case studies areas, i.e. India and Nigeria are included). Maternal death has a strong impact on the health and economic prospects for the family left behind as well. When a woman dies from complications during birth-such as eclampsia, obstructed labour or haemorrhage, the unborn is at risk of dying. ''If the infant survives birth but the mother does not, the resulting lack of nutritional support from breastfeeding leaves the baby vulnerable to malnutrition, which can itself be fatal or may increase the risk of disease or death from infection. Older siblings also may suffer in many ways without maternal care: among orphans, the risk of child labour, poor learning outcomes and lower educational attainment''.

Both Nigeria and India have made improvements in their maternal mortality ratio since the introduction of the Millennium Development Goals in 2000. The target of goal five was to reduce the MMR by three quarters between 1990 and 2015, but globally the rate was only reduced by about half. Nigeria began with an MMR of 1200 in 1990 and by 2015, the WHO estimated their MMR to be at 814, ending with a reduction of about one third. India was closer to reaching the target but also missed, starting with an MMR of 437 in 1990 and getting it down to 140 by 2015. If India has been able to reach an MMR of 109, they would have satisfied the two thirds reduction. In terms of improving the percentage of births attended by a skilled health professional, India has made greater strides than Nigeria since the introduction of the MDGs. In 1992, 34 percent of births in India were assisted by a health professional rising to 47 percent by the 2008 FHS survey. In Nigeria this same indicator was 32 percent in 1990 and rose to just 38 percent by the 2013 DHS survey. Nigeria's poor progress is likely a two-fold problem. First, the health system does not ensure access to quality care for all women due to cost, inadequate trained health personnel and lack of facilities in most rural health centres of the country.

***KEYWORDS**: Assessment, Determinant, Causes, Risk Factors, Maternal Morbidity and Mortality, Comparative Study between India and Nigeria.*

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I. INTRODUCTION

Maternal mortality is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management (WHO-ICD 10). Maternal mortality represents one of the widest health

gaps between the developed and developing nations and it is engrossing that developing nations contribute a higher to this death rate.

Globally, there has been extensive improvement in maternal health, with a decline of worldwide maternal mortality ratio (MMR) by 45% between 1990 and 2013 from an estimated 523 000 to 289 000, yielding an MMR of 210 maternal deaths per 100,000 live births.[(1)] Nonetheless, maternal health remains a significant problem in many countries, and overall progress still remains far short of the Millennium Development Goal's (MDG's) number five (5) target of reducing maternal mortality ratio by 75% by 2015. The Millennium Development Goals report has recognized that the improvement of maternal health and the decrease of maternal morbidity/mortality are two of their most important targets to improve health in the developing countries.[(2)] Maternal morbidity and mortality is usually associated with poor health environment, serious lack of health resources and inadequate information as well as lack of knowledge on recognizing danger signs.[(3)]

The best way of reliably measuring maternal mortality is through a civil registration system that registers all deaths and provides medical certification of cause of death.[(4)] However, even where such systems exist, vigilance is necessary to ensure that all maternal deaths are correctly classified. Studies have shown maternal deaths to be under-reported.[(5)] In countries lacking complete recording of adult deaths, especially in most low-income countries, alternative approaches to estimate maternal mortality are needed. Researchers have developed a range of alternative measurement strategies. United Nations Children's Fund (UNICEF), World Health Organisation (WHO), and the United Nations Population Fund (UNFPA) have previously developed global, regional, and country estimates of maternal mortality for the years 1990, 1995, and 2000 [(6)]. One of the most frequently used estimates of maternal mortality is the maternal mortality ratio. It measures obstetric risk (i.e., the risk of dying once a woman is pregnant). It therefore omits the risk of being pregnant (i.e., fertility, in a population, which is measured by the maternal mortality rate or the lifetime risk).[(7)] The international definition of the maternal mortality ratio (MMR) is the number of Direct and Indirect deaths per 100,000 live births (ICD-10).

$$\textbf{Maternal Mortality Ratio} = \frac{\textbf{Total Maternal Deaths}}{\textbf{Total Live Birth}} \times \textbf{100,000}$$

Maternal deaths may be direct or indirect. Direct maternal deaths refer to those deaths that result from obstetric complications of the pregnant state (pregnancy, labour and pueperium) from interventions, omissions, incorrect treatment or from a chain of events resulting from any of the above, while indirect deaths are those that result from previous existing disease or diseases that developed during pregnancy but, were aggravated by physiologic effects of pregnancy e.g. deaths due to anaemia, HIV/AIDS, heart disease, diabetes etc.

In nutshell maternal mortality refers to deaths caused by complications from pregnancy or childbirth, the most common causes of maternal death are severe bleeding, infections, high blood pressure, and unsafe abortion. In many countries of the world this is difficult to measure due to the lack of death certificate data as well as a lack of basic denominator data, since baseline vital statistics are also not available or unreliable.[(8)]

The issue of maternal death is important because it is preventable in most cases if the birth is attended by skilled health professionals with proper equipment, drugs, and the ability to refer to emergency obstetric care when cesareans and blood transfusions are required.[(9)] Maternal mortality rates vary according to region and income, illustrating that not only does maternal death indicate inequality between men and women but it is also indicative of a woman's economic and social status. According to the United Nation's Children Fund (UNICEF), the lifetime risk of maternal death in industrialized countries is 1 in 4,000, compared to 1 in 51 in countries labeled as 'least developed. [(10)] Ninety-nine percent of all maternal deaths occur in developing countries- more than half of these deaths occur in sub-Saharan Africa and one third in South Asia.Risk for maternal death further increases if the woman lives in a rural area.[(11)]

Maternal death has a strong impact on the heath and economic prospects for the family left behind as well. When a woman dies from complications during birth such as eclampsia, obstructed labour or haemorrhage, the unborn is at risk of dying. Moucheraudet at, write:"If the infant survives birth but the mother does not, the resulting lack of nutritional support from breastfeeding leaves the baby vulnerable to malnutrition, which can itself be fatal or may increase the risk of disease or death from infection. Older siblings also may suffer in many ways without maternal care: among orphans, the risk of child labour, poor learning outcomes and lower educational attainment". [(12)]

Sub-Saharan Africa nations continues to have the highest burden of maternal deaths (62% of global maternal deaths) as well as the highest proportion of maternal deaths due to HIV/AIDS. The adult life time risk of death from maternal causes in Sub-Saharan Africa is estimated at 1 in 38 compared to 1 in 3700 among women in developed countries.[(1)] Globally, there is increasing evidence that reduction of maternal deaths is achievable with the timely provision of quality Emergency Obstetric Care (EmOC). The challenge therefore is to focus on improving efficient and timely delivery of emergency obstetric care. Studies have shown that most

life-threatening obstetric complications cannot be predicted or prevented but can be successfully treated if prompt access to quality Emergency Obstetric services and skilled attendance are available.[13]

In addition to maternal deaths, millions more women suffer from near death complications and long-term disabilities as a result of pregnancy-related complications which also affect the lives of numerous babies. Contributory factors include lack of access to good quality maternal and neonatal health services and strong adherence to negative cultural beliefs and practices.[14]

Maternal mortality, a largely avoidable cause of death, is an important focus of international development efforts, and a target for Millennium Development Goal (MDG-5). Under MDG-5, a number of countries are committed to reducing maternal mortality ratio by three quarters between 1990 and 2015 9 (India and Nigeria are included). The link between MDGs and maternal mortality is very important in identifying drivers of trends of maternal mortality and inform appropriate policy responses. A recent article published in the Lancet in 2010 showed that maternal mortality is declining in Africa. This is in line with UN data which shows that many African countries in fact recorded large declines in maternal mortality during 1990-2008, for example, Equatorial Guinea, Eritrea, Egypt, Morocco, Cape Verde, Tunisia, Ethiopia, Algeria, Rwanda and Mauritius all recorded more than 50 per cent reduction, and are thus close to achieving MDG's fivetargeted goal, but no African country has yet achieved the goal.[15] Despite such remarkable progress, of the world's maternal deaths occurs in Sub-Saharan Africa and Asia. Notably, some countries have seen a reversal of initial gains. A case in point is Nigeria. Cases of maternal deaths in Nigeria are increasing and this is of great concern for women's health.

1.2: Maternal mortality and morbidity in India

In India, the Special bulletins on maternal mortality in India showed that the maternal mortality ratio (MMR) for the country declined from 254 per 100,000 live births in 2004 -2005 to 212 and in 2007-2009, respectively.[16] The most significant decline has been in the empowered action group (EAG) states (Bihar, Chhattisgarh, Jharkhand Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh and Uttaranchal) and Assam, where MMR declined from 375 to 308 per 100,000 live births. The life time risk for a woman in India to die of a pregnancy related cause also showed a decline from 0.7 percent to 0.6 percent over the same period. Just above one-fifth of the women in the reproductive age group in India die of pregnancy associated causes. A multi-centric task force study by the Indian Council of Medical Research (ICMR) undertaken during 2003-2005 in five States to determine cause of death in women in the reproductive age group found that 5.6 percent of all those deaths were due to causes related to pregnancy and childbirth.[17]

There are also wide regional disparities within the country, with MMR per 100,000 ranging from 81 in Kerala and 97 in Tamil Nadu at one end to 261 in Bihar/Jharkhand, 269 in Madhya Pradesh/Chhattisgarh, 318 in Rajasthan, 359 in Uttar Pradesh/Uttaranchal and 390 in Assam at the other extreme. Assam and EAG States together contribute more than 60 percent of the total maternal deaths in India.[18]

Smaller scale studies often indicate much higher levels of maternal mortality in some of the Indian states. An attempt to implement a low cost key informant surveillance system for deaths in Jharkhand and Orissayielded a MMR of 722 per 100,000 live births (C.I. 591–882). About 29 percent of all deaths in women aged 15-49 were due to causes related to pregnancy and child birth, nearly five times the all-India figure.[19]

A large majority of maternal deaths in India are preventable. Goldie et al synthesized country and region-specific data on pregnancy related events for India using a computer based model [20] that simulates the natural history of pregnancy, and estimated that 75 percent of maternal deaths could be prevented by coupling safe abortion to intensive family planning efforts, improving the access to pregnancy-related health services and high-quality facility-based intra-partum care.

The figures on maternal mortality are only the 'tip of the ice-berg', since for every woman who die, there are at least 20 others who suffer severe morbidity related to pregnancy and childbirth.[21] Whereas maternal mortality has devastating effects on the family of the deceased woman, severe maternal morbidity has a lifelong impact on the quality of life of the woman as well as her family. Though a large number of women in India suffer severe morbidity due to pregnancy and child birth each year, the exact severity of the problem is largely unknown. Data from National family health survey (NFHS) - III showed that 10 percent of women reported convulsions, 25 percent had pedal or generalisedoedema, 48 percent had excessive fatigue and four percent had vaginal bleeding associated with pregnancy. Roughly 12 percent of women had excessive vaginal bleeding following delivery, while 14 percent suffered from high fever after delivery.[22] Analysis of data collected from a household survey of 2114 mothers carried out in February 2008 in Murshidabad district of India showed that a total of 929 (43.9 percent) had post-partum morbidities in the six weeks after delivery, out of whom 191 (20.6 percent) had severe and potentially life threatening morbidities.[23]

A prospective observational study of 772 women followed up during the entire period of pregnancy and post-partum during 1995 – 96 in the 39 villages in the Gadchiroli district, Maharashtra, India showed that

the incidence of maternal morbidity was 52.6 percent, of whom around 15 percent required emergency obstetric care.[24]

1.3: Maternal mortality and morbidity in Nigeria

Maternal morbidity and mortality remains a serious concern in Nigeria, especially in the northern region and in the rural south. In 2005, the estimated total of global maternal deaths recorded was 536,000; developing countries, such as Nigeria, accounted for over 99 percent or 533,000 of the recorded deaths.[25] While having only 2 percent of the world's total population, Nigeria accounted for 10 percent of the world's total maternal deaths in 2010. Nigeria's maternal mortality rate exceeds 1,000 deaths per 100,000 live births and is much higher than the African continent average of 800 deaths per 100,000 live births.[26]

Countries in sub-Saharan Africa have some of the highest maternal mortality ratio in the world, despite a number of international initiatives aimed at reducing those rates. The global concern for maternal death can be traced to the 1987 Safe Motherhood Conference in Nairobi [27] where a call for a reduction in maternal mortality was originally made. It was at that international conference that the issue of maternal deaths was identified as a serious problem facing the developing nations. As a result, targets for maternal health and safe delivery were set for the developing nations. As well, international agencies developed the Millennium Development Goals (MDGs) which included the improvement in maternal health and reduction in maternal deaths [28]. Since then, Nigeria and other developing countries have made efforts to reduce maternal mortality rates in their countries.

Nigeria's maternal mortality ratio (MMR) decreased between 1990 and 2013. Specifically, Nigeria has one of the highest rates of decline in maternal mortality among African nations from 1,200 per 100,000 live births in 1990 to 560 per 100,000 live births in 2013 which is a reduction of 3.3 per cent. Secondly, based on the Reproductive Justice Index [29], Nigeria was ranked as one of the most reproductively "unjust" countries in Africa. Unjust countries are so ranked due to 13 indicators, including the Human Development Index of the UNDP; births attended by skilled personnel; threats of death from disease-related or ecological factors such as water pollution, malaria, HIV prevalence, and tuberculosis.[29] All of these indicators were potential factors influencing maternal morbidity and mortality based on a review of literature. Third, with a population of 182 million people in 2015, Nigeria has the largest population in all of African countries.[30] Fourth, there is comparatively more general information and journal articles on Nigeria than on many other African nations. Improving maternal health is one of the MDG goals (Goal 5), and the target is to reduce maternal mortality ratio by three-quarters between 1990 and 2015. In the MDG's framework, two indicators have been specified for monitoring progress towards the maternal health goal namely, the maternal mortality ratio and the proportion of deliveries with a skilled health care provider. Globally, the total number of maternal deaths decreased by 45% from 523,000 in 1990 to 289,000 in 2013. Similarly, global MMR declined by 45% from 380 maternal deaths per 100,000 live births in 1990 to 210 in 2013 yielding an average annual decline of 2.6%. Worldwide MMR declined annually by 3.3 % between 2005 and 2013, faster than the 2.2% average annual decline observed between 1990 and 2005.[31]

II. METHODOLOGY

This study opted to explore case-control study to assess and determine causes and the risk factors associated with maternal morbidity and mortality between India and Nigeria. The use of other methods such as a longitudinal approach to investigate the causes of maternal morbidity and mortality could be ideal, but that requires large and lengthy studies to give adequate statistical power, considering time limitation of this study and make comparison between the two case studies areas (India and Nigeria) which need reviewing a lot of similar data, hence that approach was not feasible. An alternative which avoids this difficulty was the **case-control design**.

It is evident from the literature that maternal morbidity and mortality is a social problem, and its causes vary from place to place, there was no comparative study done on the causes and risk factors associated with maternal morbidity and mortality between India and Nigeria. Assessment and Determinant of risk factors of why women are dying from pregnancy complications is more important than waiting to establish the level of maternal mortality. It was with this justification that this research works was carried out on maternal morbidity and mortality in order to assess the causes and risk factors and determine underlying contributory factors to maternal morbidity and mortality between the two case studies areas (India and Nigeria).

2.1: **Data Sources**

Secondary data was used for this research work: A multiple documents were reviewed including demographic and other surveys, government policy documents, health reports and safe motherhood guidelines, documents from bilateral and multilateral donors more especially reports from UNFPA, UNICEF, USAID and WHO, so also report from national government and development plans, as well as published similar research articles, papers, and books that other researchers carried out on India's and Nigeria's maternal morbidity and mortality were used. I had an opportune and examined at various reports on maternal programs from both case

study countries' governments and local NGOs that have put in place to reduce rates of maternal morbidity and mortality. This was necessitated me reading reports, program evaluations, and journal articles in order to map the tangled and often overlapping web of programs and aid for reproductive health. I have also considered if these programs employ any behavior change strategies. Such strategies may be used not just at the level of citizens accessing care but also for members of government and policy makers who do not recognize and value the importance of maternal and reproductive health.

The literature provides many tools and this literature review examines success stories of both case study countries (India and Nigeria) and how they managed to cut their maternal morbidity and mortality ratio (MMR), especially the key interventions, as well as government policies that significantly led to such decline. Based on previous researches reviewed, percentage living in poverty, educational attainment, religion, lack of access to quality health care, and age at marriage and childbirth are leading causes of maternal morbidity and mortality in India and Nigeria. Understanding the causes and risk factors of maternal morbidity and mortality in India and Nigeria, especially at the state level will assist local authorities in determining specific vulnerable people and places in order to develop intervention programs and services to reduce maternal morbidity and mortality to catch the targeted goal of MDG's.

I relied heavily on India and Nigeria DHS, the household surveys were conducted at various intervals beginning in the 1990s with technical assistance and donations from various bilateral and multi-lateral organizations such as USAID, UNICEF, UNFPA and WHO. They cover topics related to fertility, family planning, maternal and child health, and HIV/AIDS. The surveys include indicators such as women's education rates, rates of contraception use, and rates of delivering at home all disaggregated by state or geopolitical zones. This stage of the research was provided with a general understanding of gender equality in each country, as statistics such as literacy rates and level of education attained are separated by gender, In case of Nigeria's Demographic and Health Surveys (NDHS) data from years of 1990, 1999, 2003, 2008 and 2013 were used. These surveys from both the case study countries were carriedout by their respective governments with technical assistance from UNFPA, UNICEF, and USAID as well as WHO at various internal years. They are useful because they ask many questions and have a similar structure throughout each survey which allows for comparison; however, they only offer a national MMR that is not disaggregated by geopolitical zone or state. Without such a disaggregated statistic, state leaders may deny that there is a maternal health problem in their respective states and continue to ignore the issue. Whereas, in the case of India, I relied on the National Family Health Survey (NFHS) data from years of 1992-1993, 1998-1999, and 2005-2006. There is a currently a survey underway for years 2015-2016 but completed data is not available. These surveys are similar to Nigeria's and are carried out with technical assistance from the International Institute for Population Sciences, a partnership between the government of India and the United Nations. These surveys do provide the MMR by state, which provides valuable data on high and low performing states. India also completes its Sample Registration Survey each year to provide estimates of the country's population and fertility and mortality rates but not the MMR. Both countries should increase funding for technical capabilities necessary to complete more regular assessments of local level maternal health indicators, including the MMR, so that there is no denying the issues at hand.

III. RESULTS

The risk factors associated with maternal morbidity and mortality between India and Nigeria has shown similarities with little disparities, because India and Nigeria hold the records of highest and second largest number of actual maternal morbidities and mortalities all over the world; globally at the country level, India and Nigeria account for 31 percent of global maternal deaths: India At 17% (50 000) and Nigeria at 14% (40 000), but differ widely in terms of their maternal mortality ratio, (number of maternal deaths during a given time period per 100,000 live births during the same period) due to differences in population- Nigeria is home to 173.6 million people and India to 1.2 billion. Both of these countries are important in terms of their growing populations but have had very different experiences reducing their maternal mortality. In 2015, Nigeria's maternal mortality ratio, or MMR, was 814 compared to 174 in India for the same year. In addition to lower ratios, since 2006, India's MMR has consistently decreased from 265 while Nigeria has experienced undulating rates. Between 2007 to 2009 data Sources, Nigeria's MMR went from 884 to 829 to 883. From 2012-2014 the rates went from 819 to 821 to 820, remaining generally stagnant. However, the study found a high risk factors associated with maternal morbidity and mortality in the rural areas when compared to urban centres and equally the study found that the greatest risk of maternal morbidity and mortality was among early teenagers and older women of reproductive ages. The study also found and attributed the risk factors for maternal morbidity and mortality to the numbers of factors which includes **medical causes**; such as Antepartum haemorrhage, Postpartum haemorrhage, Preeclampsia, Eclampsia, Puerperal sepsis, Unsafe abortion, Prolonged obstructed labour, HIV, Tuberculosis (TB), Caesarian section, Ectopic pregnancy, Postpartum depression, Pneumonia, Malaria, STIs, Pregnancy related infections, Embolism and Consequences of intervention (anesthesia),

Incontinence, Obstetric fistula, Postpartum vaginal or uterine prolapse, and Worm infestation. As well as **socio-cultural causes** which include; Childhood marriage, Religion, Female genital mutilation, Parity and childbirth intervals, Three delays, Unhygienic maternal conditions, Life cycle perspective, Discriminations/gender dynamic. At same time the study found that **socio-economic causes** are; Poverty, Lack of maternal education, Anaemia, Bad governance and corruption, Lack of political support, and Poor behavioral changes. Likewise **health system causes** such as; Absence or lack of qualified medical/health personnel at the time of admission, Lack of drugs, supplies and equipment, Poor health facilities, and failure of equipment. At other hand **physical environmentcauses** such as: Urban/rural differences (places of residences), Inter-sectoral issues, Transportation and Poor road network, Electricity and Communication network which are attributed to direct and indirect causes of maternal morbidity and mortality in both the case study areas (India and Nigeria).

3:1:**Table.This table presents the results of causes and risk factors associated with maternal morbidity & mortality between India and Nigeria.**

Computed as the difference between India and Nigeria Causes and Risk Factors associated with Maternal Morbidity & mortality.	**Result comparison between India and Nigeria (by percentage)**	
	INDIA (%)	**NIGERIA (%)**
(1) Medical Causes & Risk factors Associated Maternal Morbidity and Mortality		
Antepartum haemorrhage	18.8%	58.4%
Post-partum haemorrhage	50%	88%
Pre-eclampsia	7.8% 1.5%	10%
Eclampsia	1.5%	7.6%
Puerperal sepsis	15%	1.7%
Unsafe Abortion	59%	78.3%
Miscarriage	10%	12%
Prolong obstructed labour	10.6%	20.13
HIV	20.5%	16.4%
Tuberculosis (TB)	6.4%	5.9%
Caesarian section	35.5%	46.4%
Ectopic Pregnancy	2%	4.38%
Postpartum depression	22%	22.9%
Pneumonia	41.7%	25.3%
Malaria	55%	72.0%
STIs or STDs	55.4%	37.8%
Pregnancy related infections	33.3%	61.5%
Embolisms and consequences of interventions (due to anesthesia)	3.6%	6%
Incontinence	19.2%	21.1%
Obstetric Fistula	4.5%	8.1%
Postpartum Vaginal or Uterine prolapse	20%	30%
Worm infestations	25.7%	51.5%
(2) Socio-Cultural Causes & Risk factors Associated Maternal Morbidity and Mortality		
Religion	37.5%	49%
Cultural practices	67.4%	53%
Maternal age (late marriage)	43.9%	21.6%
Childhood Marriage (early)	26.8%	48%
Female Genital Mutilation	10.2%	27%
Parity and childbirth intervals	28%	54.3%
Three delays	20.5%	28%
Unhygienic maternal Conditions	35%	40%
Life cycle perspective	40%	30%
Marital Status	45.6%	70%
Discriminations/Gender dynamics	60%	40%
(3) Socio-economic Causes & Risk factors Associated Maternal Morbidity and Mortality		
Lack of Maternal education	65.46%	35.4%
Poverty	30%	40.2%
Anaemia	19%	75%
Bad Governance and Corruption	63%	94%
Lack of Political Support	45%	35%
Poor Behavior Change Strategies	37%	53%
(4) Health System Factors Causes & Risk factors Associated Maternal Morbidity and Mortality		
Absence/lack of qualified personal at time of admission	13%	85%
Lack of drugs, supplies and equipment	10.7%	70%
Poor health facilities	61%	79%
Failure of equipment	15%	55%
(5) Physical Environment Causes & Risk factors Associated Maternal Morbidity and Mortality		
Urban/Rural Differences (places of residences)	40%	58.8%
Inter-sectoral Issues	38.4%	45%

Transportation and poor road network	23%	47%
Electricity and communication	5%	89%

IV. DISCUSSION

Based on analysis and findings, I have found there are similarities of causes and risk factors associated with maternal morbidity and mortality in the both case studies areas (India and Nigeria). However, India's has lower rate of maternal morbidity and mortality when compared to Nigeria due to concerted efforts of different policies by Indian government. Indian's policies have been more successful in providing comprehensive care for the populations most at risk, although there is still room for improvement in terms of ensuring the equal quality of services across rural and urban areas. Although corruption exists in both countries, Nigeria has struggled with national financial corruption and has proven to be less open with budget documents. I found the third component of the hypothesis, that India has lower rates of maternal morbidity and mortality than Nigeria. The analysis has shown that it is evident that women in both case study countriescountries do seek maternal health care services although not in right and desired time, more especially in rural areas. However, in case of Nigeria due to lack of sufficient number of trained health professionals that can attend to maternal problem at appropriate time even those who manage to reach to the health facilities in the right time, they neither receive quality maternal health care services nor prompt maternal health care services attention are provided to them, as such, the majority of women died as a result of direct maternal death causes or end up with life suffering maternal morbidities, like obstetric fistula or postpartum vaginal or uterine prolapse. Policy makers should tirelessly and tremendous work towards preventative causes of maternal morbidity and mortality, before, during & after childbirth, for instance, bleeding during labour is a case that can be dealt with and prevent mortality. Diseases like HIV, Tuberculosis and Pneumonia incidences are major indirect causes of maternal mortality. These points out the importance of providing emergency support to pregnant women in communities, in particular rural areas where there is high incidence and risk factors associated with maternal morbidity and mortality than urban areas or cities. In both rural India and Nigeria very significant risk factors associated with maternal morbidity and mortality have been identified and this can play a role in identifying women at higher risk of a maternal morbidity and mortality. Adolescent pregnancy is of the main factors that associated with increased risk of maternal death. This was driven by high rates of haemorrhage and eclampsia which indicates an emergency need for better antenatal and obstetric care. However, on the other hand women over thirty years also experiences the problem more especially in urban and cities areas where more often women get marriage lately, as a result of their educational attainments. Indirect causes of maternal death such as HIV/AIDS, TB, malaria and anaemia also contributed to a significant proportion of deaths, highlighting the need for effective interventions.

Most maternal deaths are avoidable and preventable, as the health-care solutions to prevent or manage complications are provided in most appropriate right time. All women need is to access an antenatal care in pregnancy, skilled care during childbirth, and care and support in the weeks after childbirth. It is particularly important that all births are attended by skilled health professionals, as timely management and treatment can make the difference between life and death. This objectives can be achieve through effective government policy of maternal healthcare services intervention through health planners and managers that should play a remarkable role in implementing obstetric services essential for life saving interventions. Finally, for effective and anticipated health outcomes, government should employ highly skilled health professionals, provide adequate health infrastructures and basic health amenities, more especially to the rural areas, and to ensure provision of essential drugs and equipment, and to provide free maternal health care services, and monitor standards of practice in maternity services.

V. CONCLUSION

The Nigeria and India governments are committed towards improvement of maternal health, as a contribution to the sustainable development of the nation. To ensure the universal health of every woman, a holistic health management, provision of free maternal health services and delivery with multi-sectoral involvement has been adopted. The public health sector has made tremendous strides in ensuring that women have access to health services, with close to 95% of pregnant women receive Ante-Natal Care (ANC) from medical professionals, and 82% are attended by skilled health workers at time of delivery. With impressive figures on women attending ANC and delivering with help of medical professionals. To end this menace, a holistic health policies is still needed to achieve the desired goal of MDGs.

A such comparative study definitely played a tremendous role by providing a better understanding of causes and risk factors associated with maternal morbidity and mortality and provides an insight from both the countries, thus, it is very crucial for informing policies and implementation of public health interventions aimed at reducing maternal morbidity and mortality.

VI. RECOMMENDATIONS

Based on the findings from both the case study countries (India and Nigeria), I recommended the following master key action plans in order to reduce the incidences of maternal morbidity and mortality which occurs as a result of preventable and avoidable causes and risk factors.

Many individual and socioeconomic factors have been associated with high maternal morbidity and mortality. These include; lack of education, parity, previous obstetric history, employment, socioeconomic status, and types of care seeking behaviors during pregnancy. The burden of maternal morbidity and mortality frequently falls on the rural areas and poor persons who have many hurdles to overcome to access timely maternal care, lack of transport infrastructure, distance to health facilities, misinformation on available maternal health services, lack of basic services, perceived negative attitude of health providers, lack of means to pay for transport or the health care services and sometimes due to reliance on traditional measures.

In view of above, I recommends the following guidelines which will helps to curtail the causes and risk factors associated with maternal morbidity and mortality at both the case study areas, as follows:-

1. Improvement and management of the already exists health facilities- though, reconstruction, rehabilitation and equipment of maternity wards, increase facility coverage by building more accessible health facilities to the population, among the nomadic and pastoral community, establish mobile and outreach clinics to improve access to such vulnerable population to vital healthcare services.

2. High rate of eclampsia indicates urgent need for training in managing hypertensive disorders of pregnancy either through use of magnesium sulphate or other anticonvulsant drugs, as well as careful monitoring during pregnancy. High proportion ofhaemorrhage should be addressed especially postpartum haemorrhage which is unpredictable, sudden in onset and more dangerous when a woman is anaemic. Since blood loss can easily lead to death, there should be prompt and appropriate lifesaving care which includes proper management of the third stage of labour, universal availability of safe blood for transfusion, and the use of appropriate uterotonic drugs.

3. Puerperal sepsis which occurs as a result of untreated sexually transmitted diseases (STDs) or poor hygiene during delivery can be effectively prevented by early detection and management of sexually transmitted diseases (STDs) during pregnancy and careful attention to antiseptic delivery. Septic abortions could also be addressed to minimize the number of deaths.

4. Obstructed labour, caused by abnormal lie (when the infant is incorrectly positioned for passage through the birth canal) or cephalopelvic disproportion (when the infant's head cannot pass through the maternal pelvis), should be addressed through emphasis on good nutrition and diet for girls and women. Also, proper conduct of delivery monitoring of women during labour (by the use of labour charts "partograms") will enable health workers to identify early women who are to develop this complication and institute appropriate management. This lays emphasis to the fact that all women should undertake deliveries under the care of skilled birth attendants and proper delivery facilities as recommended by the World Health Organization (WHO).

5. Indirect causes of maternal death such as anaemia, which causes death through cardiovascular arrest, can also underlie a substantial proportion of direct maternal causes such as puerperal sepsis and haemorrhage. Hence women need to be informed of the consequences and enabled to delay pregnancy until the conditions are treated.

6. Pregnancy complications are a primary source of maternal and child morbidity and mortality. A large proportion of maternal and neonatal deaths occur during the first 48 hours after delivery. Thus, postnatal care is important, as it treats complications arising from the delivery and provides the mother with information on how to care for herself and her child. Therefore, it is recommended that all women receive a check-up within two days of delivery (NDHS 2006-07). Obstetric complications continue to represent the major cause among women of childbearing age, far ahead of tuberculosis, suicide, sexually transmitted diseases, or AIDS (WHO, 2005b).

According to the MDG's report of 2012, most of these countries greatly improved the proportion of women giving birth with skilled attendant. They did this mainly through policy interventions that focused on improving

access through means, such as transport to referral health institutions, increased information about contraceptives and better supply of health attendants**.**

7. Severe anaemia is believed to be an important cause of maternal morbidity and mortality, mild anaemia in pregnancy may go unnoticed, but the potential adverse effects of pregnancy increase as haemoglobin levels fall. Very severe anaemia with haemoglobin levels of less than 4 g/dL can lead to heart failure and death from shock. Anaemic mothers are less able to tolerate blood loss during childbirth, and severe anaemia in pregnancy has been reported as the main cause of 8–23% of maternal deaths across the globe and hence I recommends both the governments of the case studies areas should implement good policy that will intervene to provide special nutritional supplements to their subjects, more especially to poor and vulnerable pregnant mothers.

8. A more educated mother is likely to practice healthy lifestyle behaviors, such as good nutrition. Additionally, mothers that are more educated are likely to visit the doctor, be more confident in asking healthcare questions, and understand the potential risks during their pregnancies. Educated mothers will also apply these healthy behaviors in their families and pass on these ideas about good nutrition, exercise, and other health related issues. Therefore special attention should be given to girl child education, as well as, public health education, enlightenment & awareness to the women of reproductive ages, more especially, in rural areas.

9. Improve access to quality maternal care and facility coverage through: Provision of an adequate human resource and developing mechanisms of staff retention will reducing staff attrition by offering an encouraging welfare package and enabling environment to perform, training and equipping skilled birth attendants with the necessary knowledge and skills to handle emergency obstetric care, Provide improved medical technologies for example ultrasound facilities in diagnosing and management of pregnancy to reduce morbidities and mortalities, Provision of an adequate communication system like radio sets in areas with no reliable communication mobile networks to facilitate emergency referrals, Provision of efficient means of transport (ambulances) to reach the next level of care, Provide affordable services to improve utilization of maternal health services, for example, issuing of vouchers which has been reported in some countries (Tanzania) to have increased utilization of MCH services.

In addition to above stated recommendations, India and Nigeria governments should emulates from action plans of countries that achieved MDG's targeted goals on maternal deaths in order to reduce the incidence of maternal morbidity and mortality: based on other importance of interventions that some countries achieved their MDG's 5 goals on maternal morbidity and mortality, of all health indicators, exhibits the greatest disparity between the developed and developing world. The maternal death occurring in both the case studies areas, it could be avoided if proper health resources and services are invested on maternal and child health care services. The tragedy and opportunity is that most of these maternal morbidity and mortality can be prevented with cost-effective health care services. Health care programs to improve maternal health must be supported by strong policies, adequate training of health care providers and logistical services that facilitate the provision of those programs. Once maternal and neonatal programs and policies are in place, all women and girls must be ensured equal access to the full range of services.

In view of above, I recommend both India and Nigeria governments to copy from Japan's action plans to eradicate the incidences of maternal morbidity and mortality in their domains: The example of a best country all over the world that doing well in managing maternal morbidity and mortality is that of Japan. In 1950, Japan had a maternal mortality ratio of around 180 deaths per 100, 000 live births and this was drastically reduced to 50 deaths per 100,000 live births in 1970, and by 2004/5 Japan was among the countries with the lowest maternal mortality in the world with its maternal mortality ratio of 6 deaths per 100,000 live births (Graham, 2008). This tremendous success was due to a host of factors such as; access to family planning, universal access to skilled care at delivery and timely access to emergency obstetric care for all women with complications.

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